

**UNDERCOOLING STUDIES OF THE BULK METALLIC GLASS
FORMING $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10.0}Be_{22.5}$ ALLOY DURING
CONTAINERLESS ELECTROSTATIC LEVITATION PROCESSING**

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Bulk glass forming metallic alloys have long been desired for technological applications and for investigations into liquid undercooling, solidification processes, and thermophysical properties. A glass forming alloy $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10.0}Be_{22.5}$ was used to investigate the thermal treatments affecting undercooling and vitrification. The experiments were performed using the high temperature high vacuum electrostatic levitator at JPL. A sample approximately 3 mm in diameter was melted, superheated, undercooled, and solidified while levitated in high vacuum. The results show that when the sample was held above its melting temperature for a sufficient period of time to dissolve oxides and then cooled faster than a critical cooling rate, it undercooled to the glass transition temperature, T_g , and formed a glassy alloy. The required critical cooling rate for metallic glass formation was obtained to be between 0.9 K/s and 1.2 K/s for the 42.4 mg sample.